PROC. BIOL. SOC. WASH.
94(2), 1981, pp. 622–630

PSEUDOPLUMARELLA ECHIDNA, A NEW SPECIES OF PRIMNOID OCTOCORAL FROM QUEENSLAND (COELENTERATA: OCTOCORALLIA)

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Abstract.—A new primnoid octocoral, *Pseudoplumarella echidna,* from the southern coast of Queensland, is described and illustrated by scanning electron micrography. The species is compared with the related *Pseudoplumarella corruscans* (Thomson and Mackinnon, 1911) from New South Wales, which also is illustrated. A possibly distinct variant is reported but not established as a distinct taxon.

A brief examination of octocorals in the collections of the Queensland Museum, made possible through the kindness of Dr. L. R. G. Cannon, revealed an interesting new species of the primnoid genus *Pseudoplumarella* allied to *P. corruscans* (Thomson and Mackinnon, 1911). As the octocoral fauna of Australia is still inadequately known, it is desirable to put on record descriptions of new species such as this in order to facilitate a comprehensive marine faunal inventory for Australia at some time in the future.

Pseudoplumarella Kükenthal, 1915

Plumarella (part) Thomson and Mackinnon, 1911:682.
Pseudoplumarella (part) Kükenthal, 1915:143, 145; 1924:263.

Diagnosis (emend.).—Primnoids with uniplanar, alternately pinnate branching. Polyps small, directed obliquely upward, biserial or on all sides of twigs; lateral and adaxial rows of body scales greatly reduced, adaxials absent in some species; opercular scales tall isosceles triangles, of nearly uniform size, only the adaxials being somewhat smaller, fitting closely together without overlapping, forming a prominent conical operculum; marginal scales fewer than 8, not folding over operculars; coenenchymal sclerites scalelike, sometimes with a deeper layer of small, tuberculate spheroids.

Type-species.—*Plumarella thetis* Thomson and Mackinnon, 1911; by original designation.

Remarks.—Although Kükenthal (1915, 1924) included *Plumarella plumatilis* (Milne Edwards and Haime, 1857) in his genus *Pseudoplumarella,* Versluys (1906:39) had already established the subgenus *Pterostenella* for that species. Therefore, were it not for the fact that *P. plumatilis* and *P.*

Fig. 1. *Pseudoplumarella echidna,* colonies: **A,** Holotype, Queensland Mus. Reg. No. G4710; **B,** Paratype, Queensland Mus. Reg. No. GL1; **C,** Paratype, Queensland Mus. Reg. No. GL2; **D,** Paratype, USNM 59823; **E,** Variant, Queensland Mus. Reg. No. GL3.

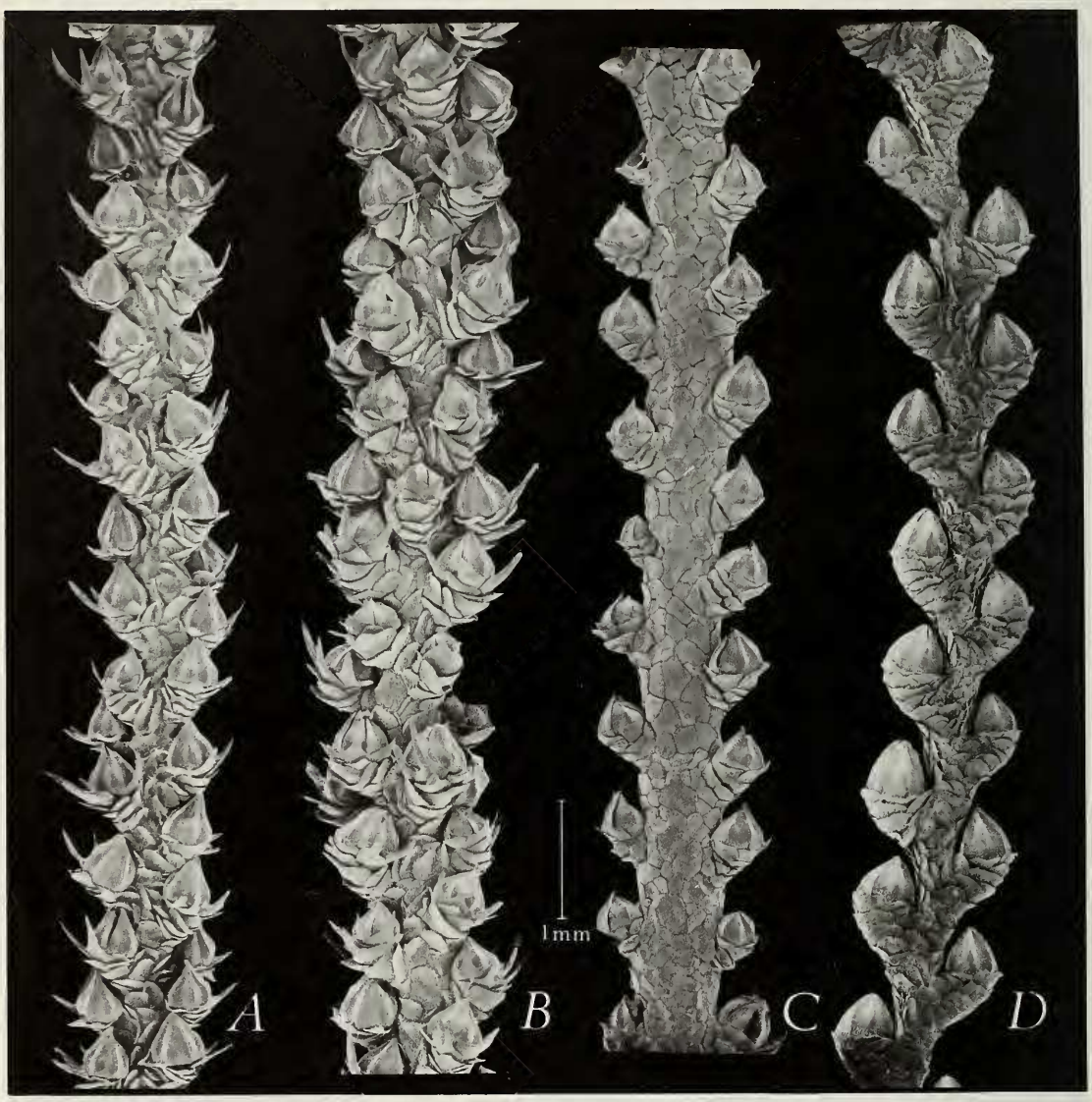

Fig. 2. **A,** *Pseudoplumarella echidna,* holotype; **B,** *P. echidna,* paratype, GL1; **C,** *P. echidna,* variant GL3; **D,** *P. corruscans,* syntype, BM(NH) 1933.3.13.73. Parts of branches with polyps; all SEM micrographs.

thetis are generically distinct, *Pseudoplumarella* would be a junior synonym. The most conspicuous distinguishing character of *Pseudoplumarella* is the tall, conical operculum composed of tightly fitting triangular scales the margins of which abut but do not overlap; the polyps may be in close spirals all around the twigs, or biserial, but not in whorls as in *Pterostenella*. The operculum of *Pterostenella* is very low, often almost flat, and is composed of overlapping scales; the polyps, which have a complete adaxial covering of scales, stand almost vertically and are arranged in widely spaced whorls.

In addition to the new species here described, the genus *Pseudopluma-*

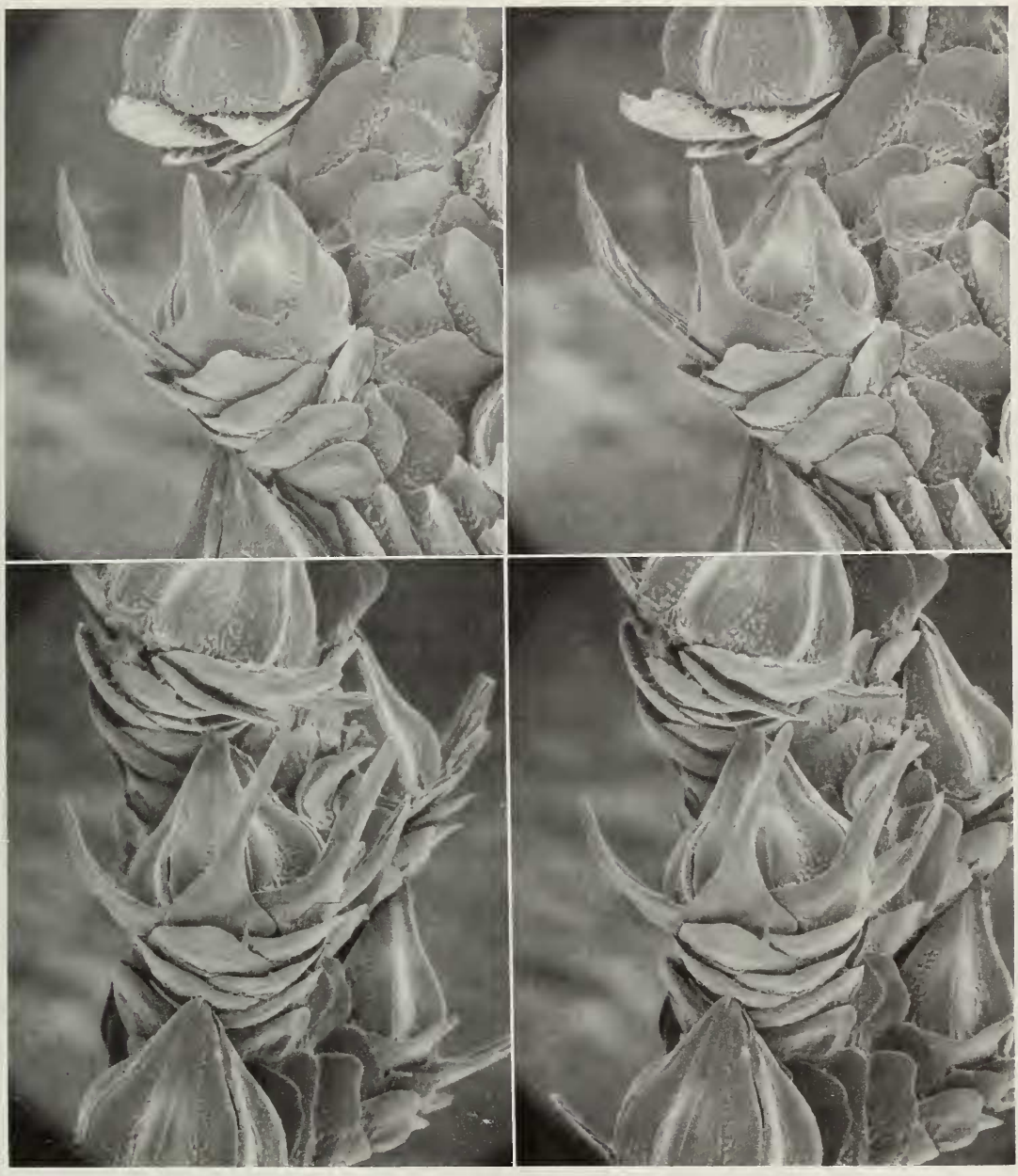

Fig. 3. *Pseudoplumarella echidna:* Lateral and abaxial views of polyp; SEM stereomicrographs, 50×.

rella includes four species: *P. thetis, P. corruscans, P. filicoides,* and *P. versluysi,* all of Thomson and Mackinnon (1911) and all from the coast of New South Wales, Australia. Unfortunately, ambiguities in the original descriptions and discrepancies between descriptions and illustrations preclude the construction of a reliable key for their separation. However, the new species is easily distinguished from the others as it is the only one that has spines on the abaxial marginal scales.

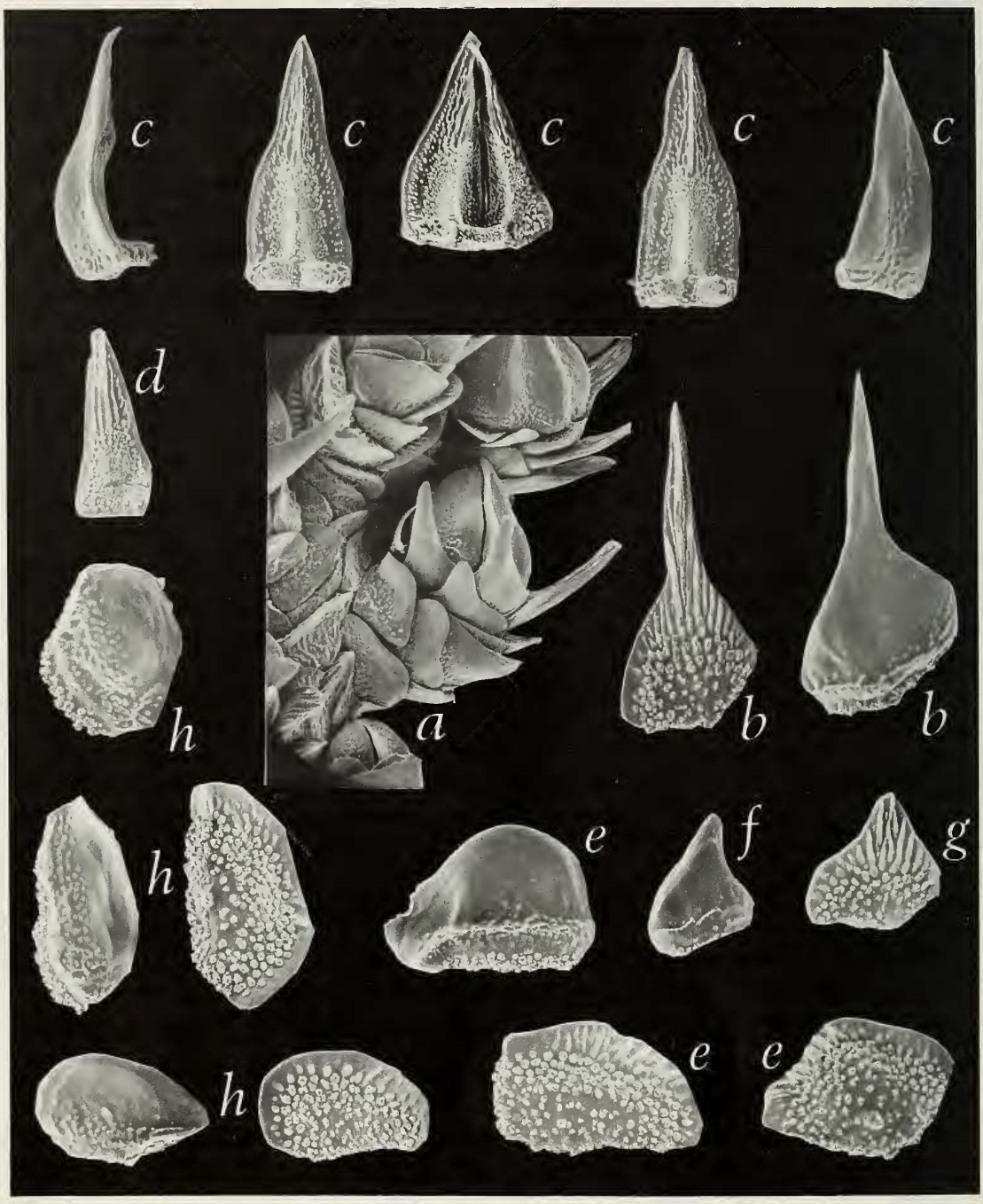

Fig. 4 *Pseudoplumarella echidna:* **A,** Lateral view of intact polyp; **B,** Marginal scales, inner and outer surfaces; **C,** Opercular scales; **D,** Adaxial opercular scale; **E,** Body scales; **F,** Submarginal scale, outer surface; **G,** Submarginal scale, inner surface; **H,** Coenenchymal scales. **A,** 38×; **B–H,** 63×.

Pseudoplumarella echidna, new species
Figs. 1a–d; 2a–b; 3–4

Material.—Four colonies, dredged amongst fan corals, Jumpin Pin, between North Stradbroke and South Stradbroke Islands, Queensland, where

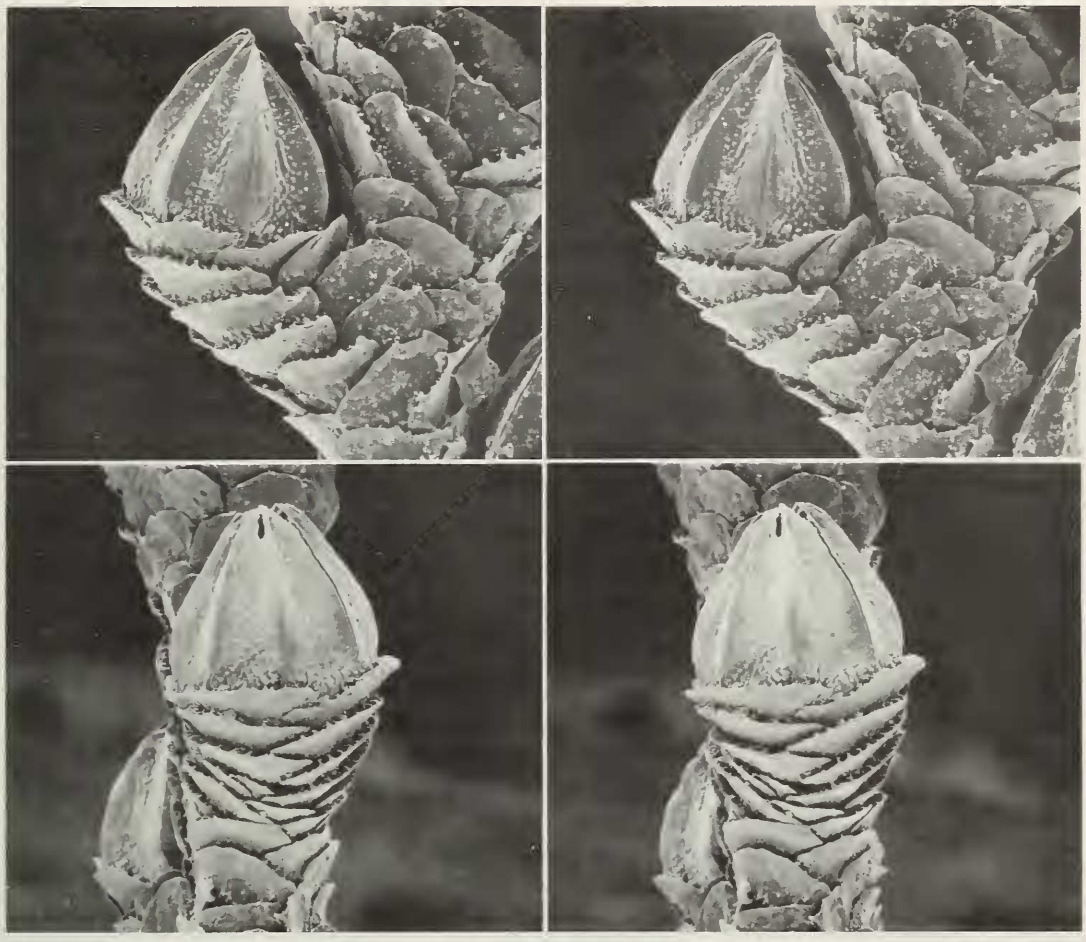

Fig. 5. *Pseudoplumarella corruscans,* syntype, BM(NH) 1933.3.13.73; lateral and abaxial views of polyp; SEM stereomicrographs, 50×.

southern Moreton Bay enters the ocean; 47 fathoms (86 m); coll. Prof. William Stephenson and student party, 1 July 1961.

Diagnosis.—*Pseudoplumarella* with distal edge of marginal scales produced into strong spine.

Description.—Colonies (Fig. 1a–d) closely and alternately pinnate, 18–21 twigs in 5 cm along one side of branch; fully developed twigs generally of rather uniform length throughout colony or within major branches, from 1.5 to 3 cm long, decreasing in length abruptly toward tips of branches. Polyps small, about 0.75 mm tall, closely biserial on unbranched twigs; operculum of one polyp often overlapping base of next polyp above; 17–20 in 1 cm along one side of twigs (Fig. 2a). Operculum tall, conical, composed of triangular scales closely fitting but not overlapping (Fig. 3), size nearly uniform (Fig. 4c) except for adaxial pair, which are somewhat smaller than the others (Fig. 4d). Marginal scales usually 4, in abaxial and outer lateral rows only, rarely a small scale below one or both inner lateral operculars; free edge of marginal scales produced as a sharp spine, that of abaxial marginals

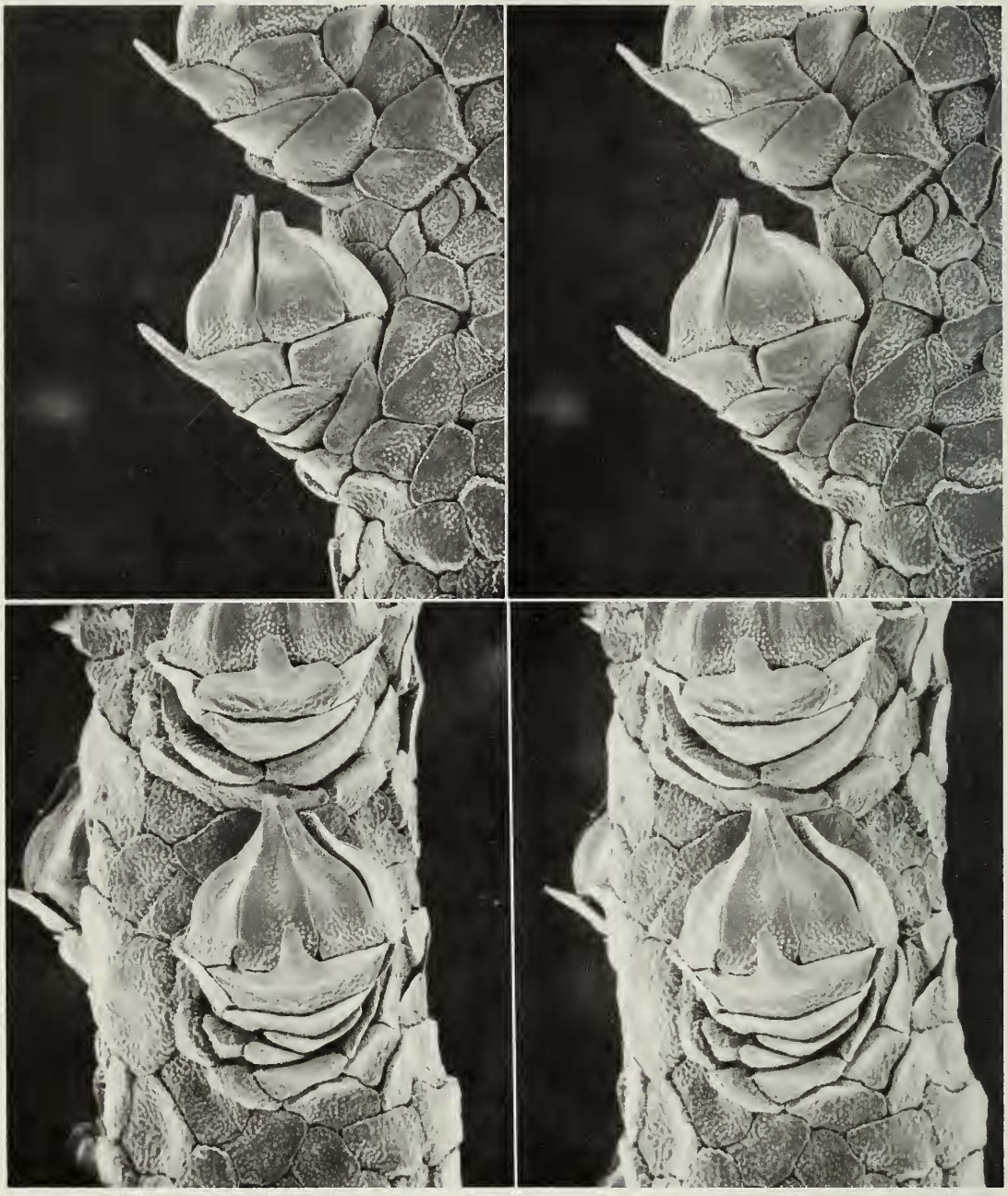

Fig. 6. *Pseudoplumarella echidna*, variant; lateral and abaxial views of polyp; SEM stereomicrographs, 50×.

stronger (Figs. 3, 4b) that of the outer laterals shorter and usually not so acute. Usually 5 (sometimes 4, rarely 6 or 3) body scales in abaxial rows, usually only 1 or 2 in outer lateral rows; body scales (Fig. 4e) oval; distal edge of submarginals sometimes produced as a low, blunt spine or rounded angle (Fig. 4f); body scales externally smooth except for some low, simple granulations on proximal part, internally tuberculated, distal edge with several sharp radial ridges (Fig. 4g). Tentacles devoid of sclerites. Coenenchy-

Table 1.—Comparison of measurements of *Pseudoplumarella curruscans* and *P. echidna*.

	Height of colony (cm)	No. of twigs in 5 cm	Length of twigs (cm)	Polyps in 1 cm	Length of polyp (mm)	No. of body scales in abax. rows
P. corruscans	44	13	4	10	1	6
P. echidna G4710	24.5	18	3	17	0.75	3–6
P. echidna GL1	22	20	1.5–2.5			
P. echidna GL2	14.5*	21	2.5–3.0	20	0.75	3–4
P. echidna 59823	11.5	21	2	20	0.75	3–6
P. echidna var.	5.5*	31	1.5	14	0.75	3–4

* Broken off at top and lacking holdfast.

mal sclerites (Fig. 4h) scalelike, rounded, squarish, broadly or narrowly oval, imbricate, their free edges upturned and outer face more or less concave, thus resembling shallow, lopsided bowls with tuberculate bottoms. Tuberculate spheroids were not observed.

Types.—Queensland Museum Register No. G4710 (holotype, Fig. 1a); GL1 (paratype, Fig. 1b); and GL2 (paratype, Fig. 1c). USNM 59823 (paratype, Fig. 1d).

Variant.—Queensland Museum Register No. GL3 (Fig. 1e).

Comparisons.—In gross colonial aspect, *Pseudoplumarella echidna* most closely resembles *P. corruscans* (Thomson and Mackinnon), but in that species the colonies are larger and the lateral twigs not so closely crowded. Although Kükenthal (1924:263) separated *P. corruscans* from *P. thetis* because "Die abaxialen Schuppen sind schmaler und haben einen freien gezahnelten Rand," this character must have been based on Thomson and Mackinnon's pl. 65, fig. 4, which does not agree with the syntype (Fig. 5) deposited in the British Museum (Nat. Hist.). Moreover, the original description makes no mention of a toothed margin on the body scales, nor does the drawing of sclerites (pl. 68, fig. 6) illustrate such a feature. Possibly, the "strongly-marked radiating ridges" on the inside border of the body scales (which are visible in the intact polyps as can be seen in Fig. 5) led to the erroneous drawing of the polyps.

Pseudoplumarella echidna also resembles the Japanese *Plumarella spinosa* Kinoshita, 1908. That species has similar, closely pinnate branching and small, biserial polyps with spinous marginal scales, but there are 8 marginals, 6 of them with spines, and the opercular overlap in such a way that the operculum forms only a low cone or is nearly flat.

The polyps of *P. corruscans* are mostly about 1 mm tall (Fig. 5) and they do not overlap one another along the branch (Fig. 2d), so about 10 occur in 1 cm along one side of a branch, compared with 17–20 in *P. echidna*.

The measurements of *Pseudoplumarella corruscans* as presented by Thomson and Mackinnon (1911:684) are compared with those of the present specimens in Table 1.

A single specimen from the haul that yielded the holotype and paratypes of *P. echidna* differs in features that may be of specific importance, but the lack of additional specimens precludes establishing it as a new species at this time. It differs from *P. echidna* in the following ways: the colony (Fig. 1e) is smaller (a little over 5 cm tall, but in damaged condition), the twigs shorter (1.5 cm) and more crowded (31 in 5 cm along one side of a branch), and the polyps less crowded (14 in 1 cm along one side of twig) (Fig. 2c); in many polyps the abaxial body scales are reduced to a single row of 3 or 4, the marginal spines are not so strong, and the coenenchymal scales fit tightly, with little or no overlap (Fig. 6). Differences of this magnitude would ordinarily be considered of specific importance. However, the size differences could be related to the immediate environment of that colony, and the reduction of the abaxial body scales to a single row could be an individual anomaly, so this specimen is treated as a possible variant of *Pseudoplumarella echidna* pending the study of adequate material.

Acknowledgments

I am grateful to Dr. L. R. G. Cannon of the Queensland Museum, who made these specimens available for study, and to the Queen Elizabeth Fellowship Program, and especially to Drs. J. T. Baker, John Pollard, and Shirley Dryden, who made it possible for me to carry out a highly productive research program in Australia during June–September 1980.

The scanning electron micrographs reproduced herein were made by Walter R. Brown, Chief of the S.E.M. Laboratory, Smithsonian Institution, and the photographs of colonies were made by Michael R. Carpenter, who also assisted in the final preparation of the plates.

This paper has benefitted from the criticisms of my colleagues Drs. W. Duane Hope and Raymond B. Manning, to whom I am grateful for time spent in my behalf.

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